5-1-1980

Test 1345: Allis-Chalmers 7010 Power Director Diesel 20-Speed

Tractor Museum
University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

NEBRASKA TRACTOR TEST 1345
ALLIS CHALMERS 7010 POWER DIRECTOR DIESEL
20 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1021 rpm)								
106.53	2300	6.989	0.463	15.24	191	58	75	28.893
(79.44)		*(26.456)*	*(0.282)*	*(3.003)*	*(88.1)*	*(14.5)*	*(23.9)*	*(97.568)*
Standard Power Take-Off Speed (1000 rpm)—One Hour								
107.52	2253	6.944	0.456	15.48	193	58	75	28.890
(80.18)		*(26.287)*	*(0.277)*	*(3.050)*	*(89.2)*	*(14.4)*	*(23.9)*	*(97.557)*
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
96.41	2452	6.831	0.500	14.11	189	58	75	.....
(71.89)		*(25.858)*	*(0.304)*	*(2.780)*	*(87.2)*	*(14.4)*	*(23.9)*	.....
0.00	2572	2.566	.....	.....	178	58	74	.....
(0.00)		*(9.713)*	.....	.....	*(81.4)*	*(14.4)*	*(23.6)*	.....
49.38	2511	4.647	0.665	10.62	186	58	74	.....
(36.82)		*(17.592)*	*(0.404)*	*(2.093)*	*(85.8)*	*(14.4)*	*(23.6)*	.....
107.21	2300	7.001	0.461	15.31	194	59	76	.....
(79.94)		*(26.501)*	*(0.281)*	*(3.017)*	*(89.7)*	*(15.0)*	*(24.4)*	.....
24.99	2542	3.602	1.018	6.94	180	59	75	.....
(18.63)		*(13.636)*	*(0.619)*	*(1.366)*	*(82.2)*	*(15.0)*	*(23.9)*	.....
73.04	2477	5.692	0.550	12.83	190	60	76	.....
(54.46)		*(21.548)*	*(0.335)*	*(2.528)*	*(87.8)*	*(15.3)*	*(24.2)*	.....
Av 58.50	**2476**	**5.057**	**0.610**	**11.57**	**186**	**59**	**75**	**28.890**
Av (43.63)		***(19.141)***	***(0.371)***	***(2.279)***	***(85.7)***	***(14.8)***	***(23.9)***	***(97.557)***

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 11th (5SL) Gear											
87.83	5448	6.05	2302	7.60	6.974	0.561	12.59	187	43	56	29.020
(65.49)	*(24.23)*	*(9.73)*			*(26.399)*	*(0.341)*	*(2.481)*	*(85.8)*	*(6.1)*	*(13.3)*	*(97.996)*
75% of Pull at Maximum Power—Ten Hours 11th (5SL) Gear											
75.38	4254	6.64	2468	5.38	6.563	0.615	11.48	186	47	60	28.746
(56.21)	*(18.92)*	*(10.69)*			*(24.845)*	*(0.374)*	*(2.262)*	*(85.4)*	*(8.1)*	*(15.7)*	*(97.071)*
50% of Pull at Maximum Power—Two Hours 11th (5SL) Gear											
51.72	2834	6.84	2500	3.81	5.346	0.730	9.68	183	46	61	28.975
(38.57)	*(12.61)*	*(11.02)*			*(20.235)*	*(0.444)*	*(1.906)*	*(83.9)*	*(7.5)*	*(16.1)*	*(97.844)*
50% of Pull at Reduced Engine Speed—Two Hours 14th (2FH) Gear											
52.10	2857	6.84	1882	3.81	4.372	0.593	11.92	184	59	68	28.325
(38.85)	*(12.71)*	*(11.00)*			*(16.550)*	*(0.360)*	*(2.347)*	*(84.4)*	*(15.0)*	*(19.7)*	*(95.649)*
MAXIMUM POWER IN SELECTED GEARS											
79.19	9426	3.15	2427	14.95	4th (1 FL) Gear			184	55	62	28.320
(59.05)	*(41.93)*	*(5.07)*						*(84.4)*	*(12.8)*	*(16.7)*	*(95.632)*
78.33	8852	3.32	2301	14.95	5th (2 SH) Gear			187	62	73	28.340
(58.41)	*(39.37)*	*(5.34)*						*(86.1)*	*(16.7)*	*(22.8)*	*(95.700)*
84.30	8281	3.82	2301	12.10	6th (1 FH) Gear			188	56	63	28.320
(62.86)	*(36.83)*	*(6.14)*						*(86.7)*	*(13.3)*	*(17.2)*	*(95.632)*
85.08	8382	3.81	2301	12.29	7th (3 SL) Gear			188	56	63	28.320
(63.45)	*(37.29)*	*(6.13)*						*(86.7)*	*(13.3)*	*(17.2)*	*(95.632)*
88.14	7703	4.29	2302	11.52	8th (4 SL) Gear			186	39	50	29.050
(65.72)	*(34.26)*	*(6.91)*						*(85.6)*	*(3.9)*	*(10.0)*	*(98.097)*
87.75	6789	4.85	2298	9.54	9th (3 SH) Gear			185	38	48	29.060
(65.44)	*(30.20)*	*(7.80)*						*(85.0)*	*(3.3)*	*(8.9)*	*(98.131)*
89.11	6080	5.50	2300	8.30	10th (4 SH) Gear			186	38	48	29.060
(66.45)	*(27.05)*	*(8.84)*						*(85.3)*	*(3.3)*	*(8.9)*	*(98.131)*
91.44	5671	6.05	2300	7.53	11th (5 SL) Gear			186	36	45	29.060
(68.19)	*(25.23)*	*(9.73)*						*(85.6)*	*(2.2)*	*(7.2)*	*(98.131)*
90.53	5193	6.54	2301	7.03	12th (2 FL) Gear			186	39	50	29.050
(67.51)	*(23.10)*	*(10.52)*						*(85.6)*	*(3.9)*	*(10.0)*	*(98.097)*
86.87	4270	7.63	2302	5.80	13th (5 SH) Gear			187	40	51	29.050
(64.78)	*(19.00)*	*(12.28)*						*(86.1)*	*(4.4)*	*(10.6)*	*(98.097)*
90.42	4128	8.21	2300	5.43	14th (2 FH) Gear			186	40	51	29.050
(67.42)	*(18.36)*	*(13.22)*						*(85.6)*	*(4.4)*	*(10.6)*	*(98.097)*

Department of Agricultural Engineering

Dates of Test: May 1—13, 1980

Manufacturer: ALLIS CHALMERS CORPORATION, P.O. Box 512, Milwaukee, Wisconsin 53201

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 47.9 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8482 **Fuel weight** 7.062 lbs/gal *(0.846 kg/l)* **Oil SAE** 30 **API service classification** SE-CD **To motor** 3.279 gal *(12.411 l)* **Drained from motor** 2.900 gal *(10.977 l)* **Transmission and final drive lubricant** A.C. Power fluid 821 **Total time engine was operated** 41.0 hours.

ENGINE Make Allis Chalmers Dsl **Type** six cylinder vertical with turbocharger **Serial No.** 4907684 **Crankshaft** lengthwise **Rated rpm** 2300 **Bore and stroke** 3.875″ × 4.25″ *(98.4 mm × 107.9 mm)* **Compression ratio** 16.25 to 1 **Displacement** 301 cu in *(4932 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements with centrifugal precleaner **Oil filter** two full flow elements **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge **Muffler** vertical **Cooling medium temperature control** two thermostats

CHASSIS: Type standard **Serial No.** 7010 1649 **Tread width** rear 64″ *(1626 mm)* to 97″ *(2464 mm)* front 60″ *(1524 mm)* to 91″ *(2311 mm)* **Wheel base** 106″ *(2692 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 30.8″ *(782 mm)* Vertical distance above roadway 38.7″ *(983 mm)* Horizontal distance from center of rear wheel tread 0″ *(0 mm)* to the right/left **Hydraulic control system** direct engine drive **Transmission** Selective gear fixed ratio with partial (2) range operator controlled power shift **Advertised speeds mph *(km/h)*** first 1.6 *(2.6)* second 2.0 *(3.2)* third 3.3 *(5.3)* fourth 3.7 *(6.0)* fifth 4.1 *(6.6)* sixth 4.5 *(7.2)* seventh 4.5 *(7.2)* eighth 5.1 *(8.2)* ninth 5.6 *(9.0)* tenth 6.2 *(10.0)* eleventh 6.8 *(11.0)* twelfth 7.3 *(11.7)* thirteenth 8.4 *(13.5)* fourteenth 9.1 *(14.6)* fifteenth 10.1 *(16.3)* sixteenth 11.3 *(18.3)* seventeenth 12.5 *(20.1)* eighteenth 13.9 *(22.4)* nineteenth 15.2 *(24.5)* twentieth 18.8 *(30.3)* reverse 3.1 *(5.0)*, 3.8 *(6.1)*, 6.8 *(11.0)*, 8.4 *(13.5)* **Clutch** multiple wet disc hydraulically operated by foot pedal **Brakes** multiple wet disc hydraulically operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 149″ *(3.79 m)* left 148″ *(3.75 m)* (on concrete surface without brake) right 168″ *(4.26 m)* left 167″ *(4.25 m)* **Turning space diameter** (on concrete surface with brake applied) right 310″ *(7.87 m)* left 306″ *(7.77 m)* (on concrete surface without brake) right 346″ *(8.80 m)* left 346″ *(8.78 m)* **Power take-off** 1000 rpm at 2253 engine rpm and 540 rpm at 2230 engine rpm.

LUGGING ABILITY IN 11th (5 SL) GEAR

Crankshaft Speed rpm	2300	2072	1841	1613	1382	1155
Pull—lbs *(kN)*	5671 *(25.23)*	6337 *(28.19)*	6622 *(29.46)*	7096 *(31.56)*	7155 *(31.83)*	6206 *(27.61)*
Increase in Pull %	0	12	17	25	26	9
Power—Hp *(kW)*	91.44 *(68.19)*	91.04 *(67.89)*	84.02 *(62.65)*	78.19 *(58.30)*	67.47 *(50.31)*	49.78 *(37.12)*
Speed—Mph *(km/h)*	6.05 *(9.73)*	5.39 *(8.67)*	4.76 *(7.66)*	4.13 *(6.65)*	3.54 *(5.69)*	3.01 *(4.84)*
Slip %	7.53	8.58	9.13	9.94	10.07	8.44

TRACTOR SOUND LEVEL WITH CAB	**dB(A)**
Maximum Available Power—Two Hours	77.5
75% of Pull at Maximum Power—Ten Hours	77.5
50% of Pull at Maximum Power—Two Hours	76.5
50% of Pull at Reduced Engine Speed—Two Hours	75.0
Bystander in 20th (5 FH) gear	87.5

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Two 18.4-38; 8; 18 *(125)*	Two 18.4-38; 8; 18 *(125)*
Ballast	—Liquid (each)	658 lb *(298 kg)*	None
	—Cast Iron (each)	None	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 10.00-16; 6; 32 *(220)*	Two 10.00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Cast Iron (each)	108 lb *(49 kg)*	None
Height of Drawbar		20.0 in *(510 mm)*	20.0 in *(510 mm)*
Static Weight with Operator	—Rear	9300 lb *(4218 kg)*	7985 lb *(3622 kg)*
	—Front	3490 lb *(1583 kg)*	3275 lb *(1486 kg)*
	—Total	12790 lb *(5801 kg)*	11260 lb *(5108 kg)*

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump was 142°F *(61.1°C)*. Eleven gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1345.**

LOUIS I. LEVITICUS
Engineer-in Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
K. VON BARGEN
Board of Tractor Test Engineers

Allis Chalmers 7010 Power Director Dsl

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Roy G. Arnold, Director